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Maratus nemo: A new wetland species of peacock spider from South Australia (Araneae, Salticidae, Euophryini)

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Abstract

A new species of peacock spider, *Maratus nemo* **sp. nov.**, is described from the vicinities of Mount McIntyre and Nangwarry, South Australia. Unusual among members of its genus, the new species appears to inhabit ephemeral wetland complexes on marshy vegetation in shallow water. The discovery of *Maratus nemo* **sp. nov.** is one of several recently described species attributed to the growing interest in amateur invertebrate macrophotography, with putative new species brought to attention of taxonomists through social media engagement.

Key Words

Taxonomy, jumping spider, salticid, euophryine, systematics, morphology

Introduction

The Australian endemic peacock spiders belonging to the genera *Maratus* Karsch, 1878 have attracted recent taxonomic interest with 76 of the 91 valid species described in the last 10 years alone (Otto and Hill 2020; Otto and Hill 2021; World Spider Catalogue 2021) (excluding all species listed as *incertae sedis* in Otto and Hill 2012 or *genus incertus* in Otto and Hill 2014). This interest is largely driven by the captivating courtship behaviour and vibrant colouration of the males of most species.

Adult males of *Maratus* are distinguished from other euophryine genera by the presence of a dorsal opisthosomal plate often covered with vibrantly coloured scales (but not always), an elongated and usually ornamented third pair of legs, and by the courtship behaviour of most species – males of which elevate the opisthosoma and wave the third pair of legs to display to females (Girard et al. 2021; Hill and Otto 2011; Schubert 2020).

Recent developments in practical, portable camera technology and widespread social media engagement have resulted in greater exposure of these spiders to amateur naturalists. Several species have been described through such avenues of discovery (see Otto and Hill 2013; Schubert 2020; Waldock et al. 2020). A new species of *Maratus* is herein described, based on five specimens collected from the vicinities of Mount McIntyre and Nangwarry, South Australia. The species was first brought to attention through photographs taken by Sheryl Holliday (Nature Glenelg Trust, South Australia) and shared on social media. The description of this species brings the total number of valid *Maratus* species to 92.

Materials and methods

Spiders examined for this study were hand-collected by Sheryl Holliday in South Australia in November 2020. Males and a single female of the species described here were determined to be conspecific by being encountered together in close proximity in the field, and by courtship interactions in the laboratory. Type specimens were preserved in 96% ethanol and have been lodged in the research collection of the South Australian Museum

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(SAM). Latitude and longitude were determined using a GPS receiver.

Type specimens were examined with a Leica M205C and photographed utilising a Leica DFC450 camera attachment. Measurements of the specimens were made using the measuring tool on Leica Application Suite 5.2 and cross-examined with the measurement tool on ImageJ. Photographs of live spiders were produced with an Olympus EM-1 Mark II with an Olympus M-Zuiko 60 mm macro lens. Observations of the courtship displays of the spiders were documented in a laboratory setting. Distribution maps were created using information provided by NASA Visible Earth imaging.

All measurements are in millimetres (mm). Abbreviations are as follows: **ALE** anterior lateral eyes; **AME** anterior median eyes; **ED** embolic disc; **PLE** posterior lateral eyes; **PME** posterior median eyes; **TL** tegular lobe; **RSDL** retrolateral sperm duct loop; **RTA** retrolateral tibial apophysis. Methodology and taxonomic descriptions are based on the formats of Baehr and Whyte (2016), Otto and Hill (2020) and Schubert (2020). Total length measurement refers to the distance from the anterior margin of the carapace to the posterior margin of the opisthosoma (excluding spinnerets and eyes).

Systematics

Family SALTICIDAE Blackwall, 1841
Tribe EUOPHRYINI Simon, 1901

Genus *Maratus* Karsch, 1878

Maratus Karsch, 1878: 27. Type species, by monotypy: *Maratus amabilis* Karsch, 1878.

In synonymy. ***Hypoblemum*** Peckham & Peckham, 1886 = ***Maratus*** Karsch, 1878 (Otto & Hill 2021)

Lycidas Karsch, 1878 = ***Maratus*** Karsch, 1878 (Otto & Hill 2012)

Saratus Otto & Hill, 2017 = ***Maratus*** Karsch, 1878 (Otto & Hill 2021)

Maratus nemo sp. nov.

http://zoobank.org/62D4C102-1CB9-4F5A-A056-2CCD5FB1B466

Figs 1–8

Material examined. Holotype male (SAM NN30706) from Australia, South Australia, Mount Burr Swamp, 9.5km SSE of Mount McIntyre, 37°36'22.43"S, 140°33'15.92"E, 2 Nov 2020, hand collected, S. Holliday.

Paratype male (SAM NN30707) from Australia, South Australia, Mount Burr Swamp, 9.4km SSE of Mount McIntyre, 37°36'19.91"S, 140°33'17.85"E, 2 Nov 2020, hand collected, S. Holliday.

Two paratype males (SAM NN30708, NN30709)**, one paratype female** (SAM NN30710) Edge of South Australian and Victorian Border near Topperwein Native Forest Reserve, 14.1 km E of Nangwarry, 37°32'22.05"S, 140°58'23.34"E, 2 Nov 2020, hand collected, S. Holliday.

Etymology. The specific epithet refers to the colouration of the male of this species which resembles that of the character Nemo in the 2003 Walt Disney film 'Finding Nemo' – to be treated as a noun in apposition.

Diagnosis. Males of *Maratus nemo* share some similarities to members of the Western Australian *Maratus personatus* group (Otto and Hill 2019; Otto and Hill 2021) in having the anterior ocular area ornamented with coloured scales, so as to form a 'mask', and in lacking opisthosomal colouration or flaps. It is thus tentatively placed in this species group (see Girard et al. 2021; Otto and Hill 2021; and Schubert 2020 about the tentative nature of subgeneric clades within *Maratus*). *Maratus nemo*, however, can be readily separated from members of this species group and all other congeners by the following combination of characters: bright orange field of scales covering the clypeus and anterior ocular region (Figs 1A–F, 2A–D, 6A–D) light covering of fine white setae on the carapace, legs, and mostly glabrous dorsal opisthosomal plate (Figs 1A–F, 2A–D, 6A–D); relatively compact embolic disc by which the inner and outer rings of the embolus are in close contact or fused to form a single heavy apex (Fig. 3A–C); dark lateral sclerite proximal to the embolus; distinct thick extension or flange along the proximal arc of embolus (Fig. 3A). Females of *M. nemo* are similar to other *Maratus* females and identification may not be possible without association with a male.

Description. ***Male* (*Holotype*):** Carapace dark brown, almost black with light covering of white setae; more densely covered at lateral and posterior slopes (Fig. 1A–F). Ocular quadrangle region covered thickly in bright orange scales and interrupted by two tracts of white scales behind each AME (Figs 1A–F, 2A–D). Thin marginal band of white setae present at rim of carapace (Fig. 1A–F).

PME closer to PLE than to ALE. Surface surrounding AME and ALE and clypeus thickly covered with short, bright orange scales (Fig. 1A–F). Chelicerae dark brown and glabrous. Coxae and endites pale, labium dark brown and glabrous. Sternum dark brown with light covering of fine, white setae (Fig. 2C).

Dorsal opisthosoma dark brown and indistinctly marked with light covering of white scales. Border of dorsal opisthosoma more thickly covered with white scales (Fig. 1A–F). Colular tuft of white setae situated above black spinnerets (Fig. 8C, worn in Fig. 1A–F. See variation section). Ventral opisthosoma dark brown and scattered with short, white setae (Fig. 2C). Opisthosoma lacking any form of opisthosomal flaps.

Legs I and II subequal in length, legs III and IV longer, legs III longest. Integument of each leg dark brown with alternating rings of pale, yellowish cuticle; more prominently so on tarsal and metatarsal surfaces and coxae. Each leg with an incomplete cover of white setae (Fig. 1A–F). Dorsal pedipalp distinctly ornamented

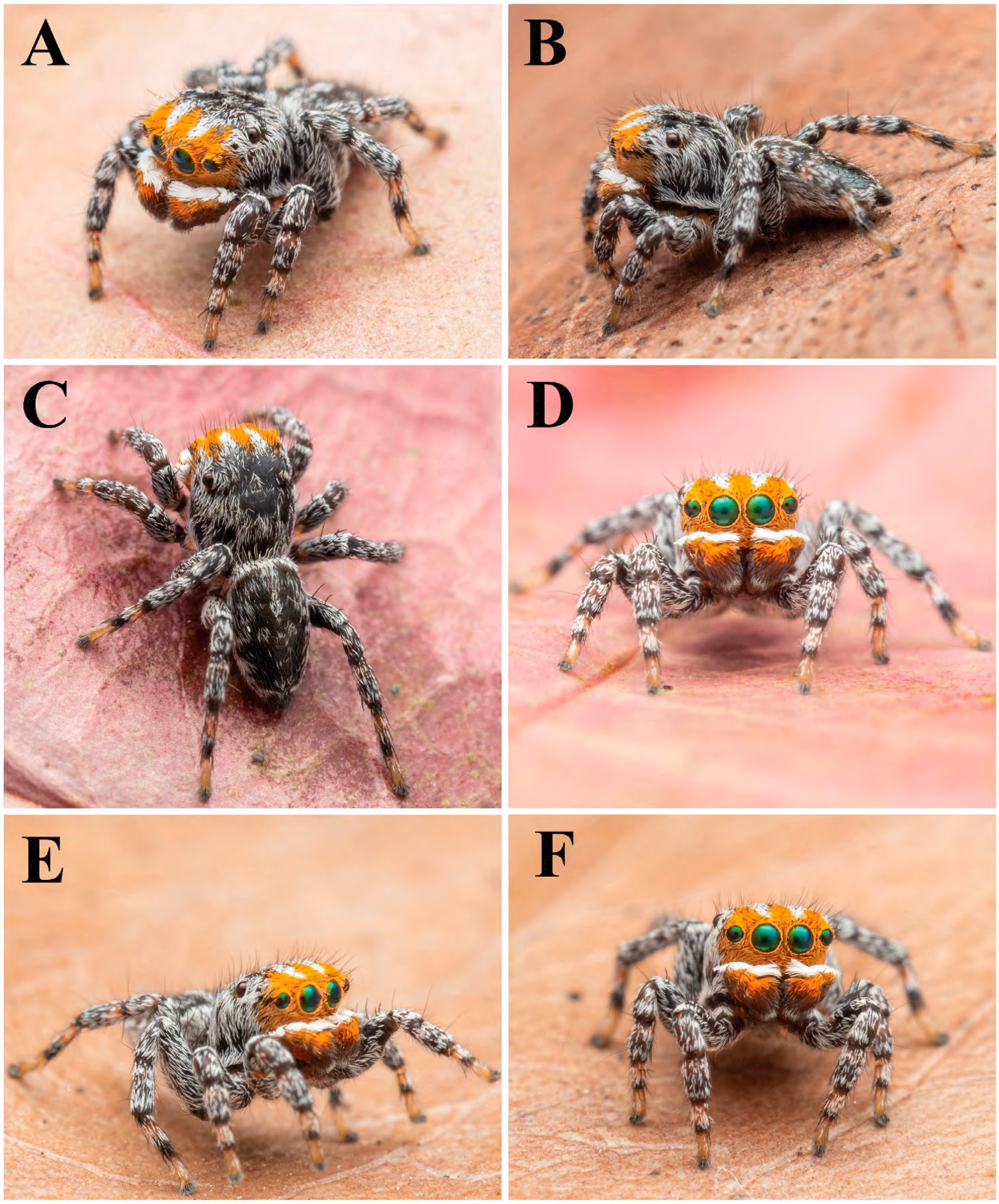

Figure 1. Habitus of living paratype male *Maratus nemo* sp. nov. (SAM NN30709) **A** anterolateral view **B** lateral view **C** dorsal view **D** anterior view **E** anterolateral view **F** anterior view.

with prominent fringes of long white setae proximal to cymbium, bright orange setae on cymbium, and grey setae distally (Figs 1A–F, 2C, D.). Relatively large male palpal bulb with retrolateral sperm duct loop, large retrobasal tegular lobe, finger-like retrolateral tibial apophysis with light dentition (Fig. 3A–C). Relatively compact embolic disc of left pedipalp coiled anticlockwise, apices of inner and outer rings of embolus in close contact or fused to form a single heavy apex; distinct thick extension or flange along the proximal arc of embolus (Fig. 3A). Heavily sclerotized cuticle on tegulum prolaterally below embolic disc (Fig. 3A–C).

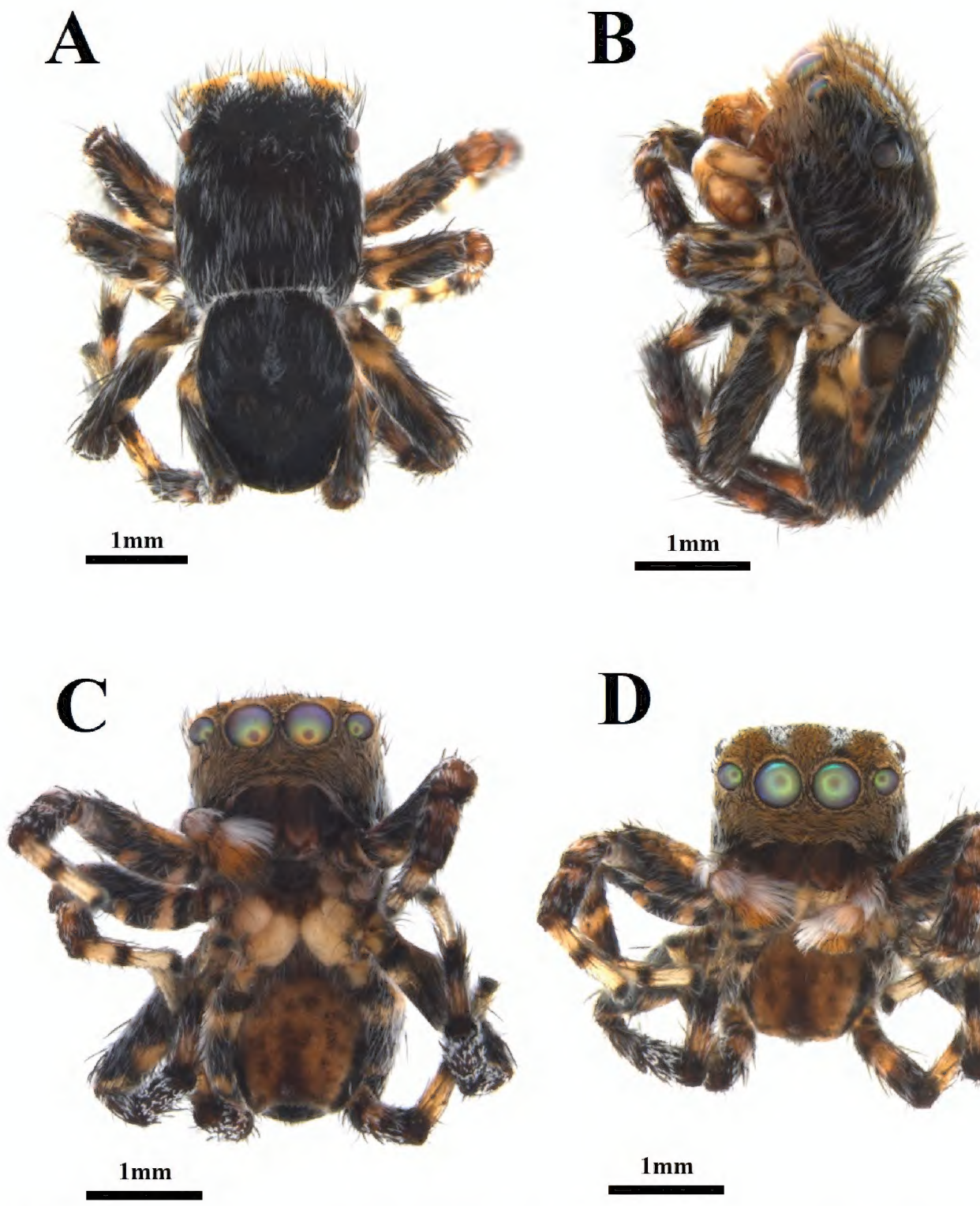

Figure 2. Preserved holotype *Maratus nemo* sp. nov. (SAM NN30706) **A** dorsal view **B** lateral view **C** ventral view **D** anterior view. Scale bars: 1mm).

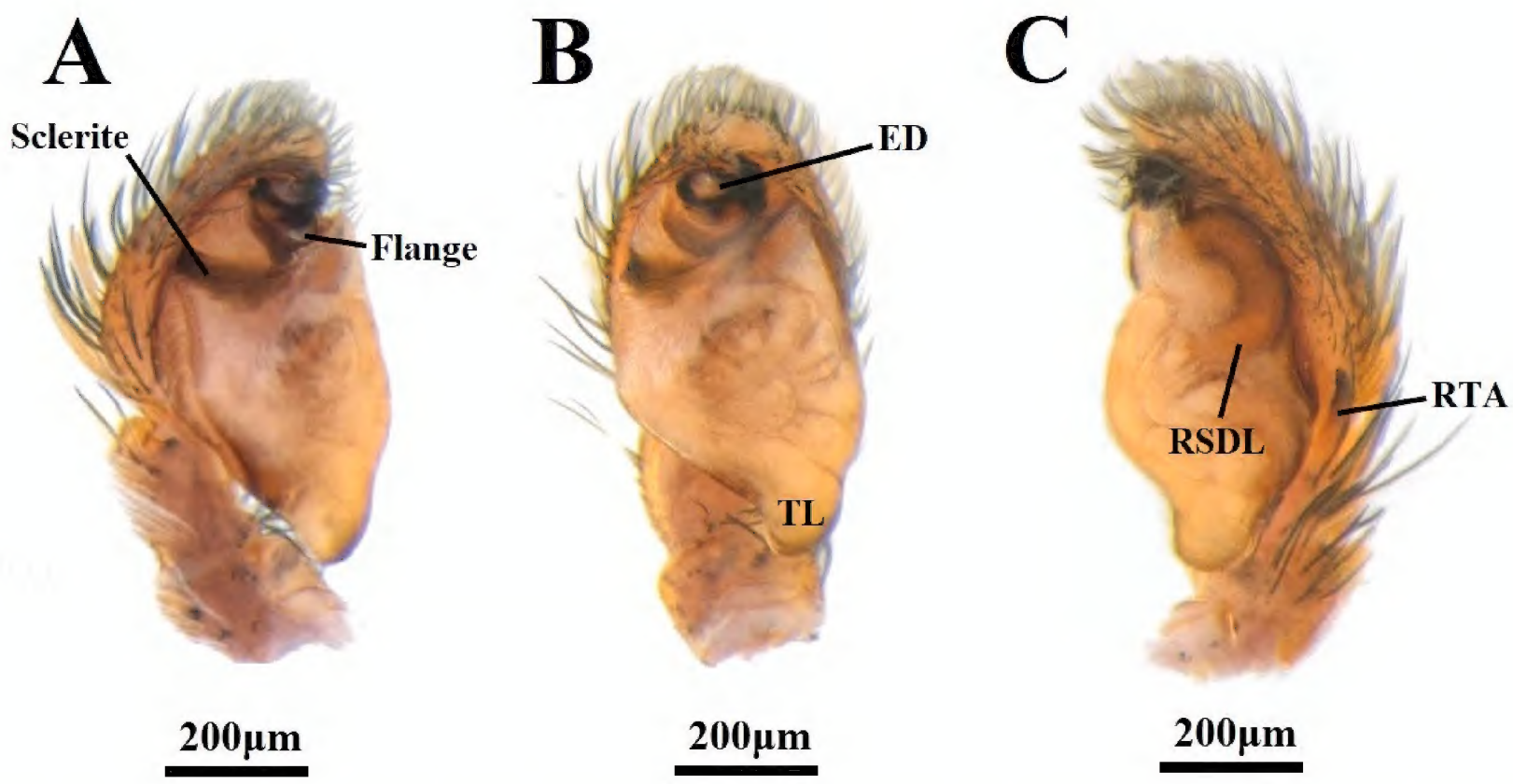

Figure 3. Preserved holotype *Maratus nemo* sp. nov. (SAM NN30706): left pedipalp structure **A** prolateral view showing dark lateral sclerite proximal to the embolus and distinct thick extension or flange along the proximal arc of embolus **B** ventral view showing embolic disc and tegular lobe **C** retrolateral view showing finger-like retrolateral tibial apophysis and retrolateral sperm duct loop. Scale bars 0.2mm.

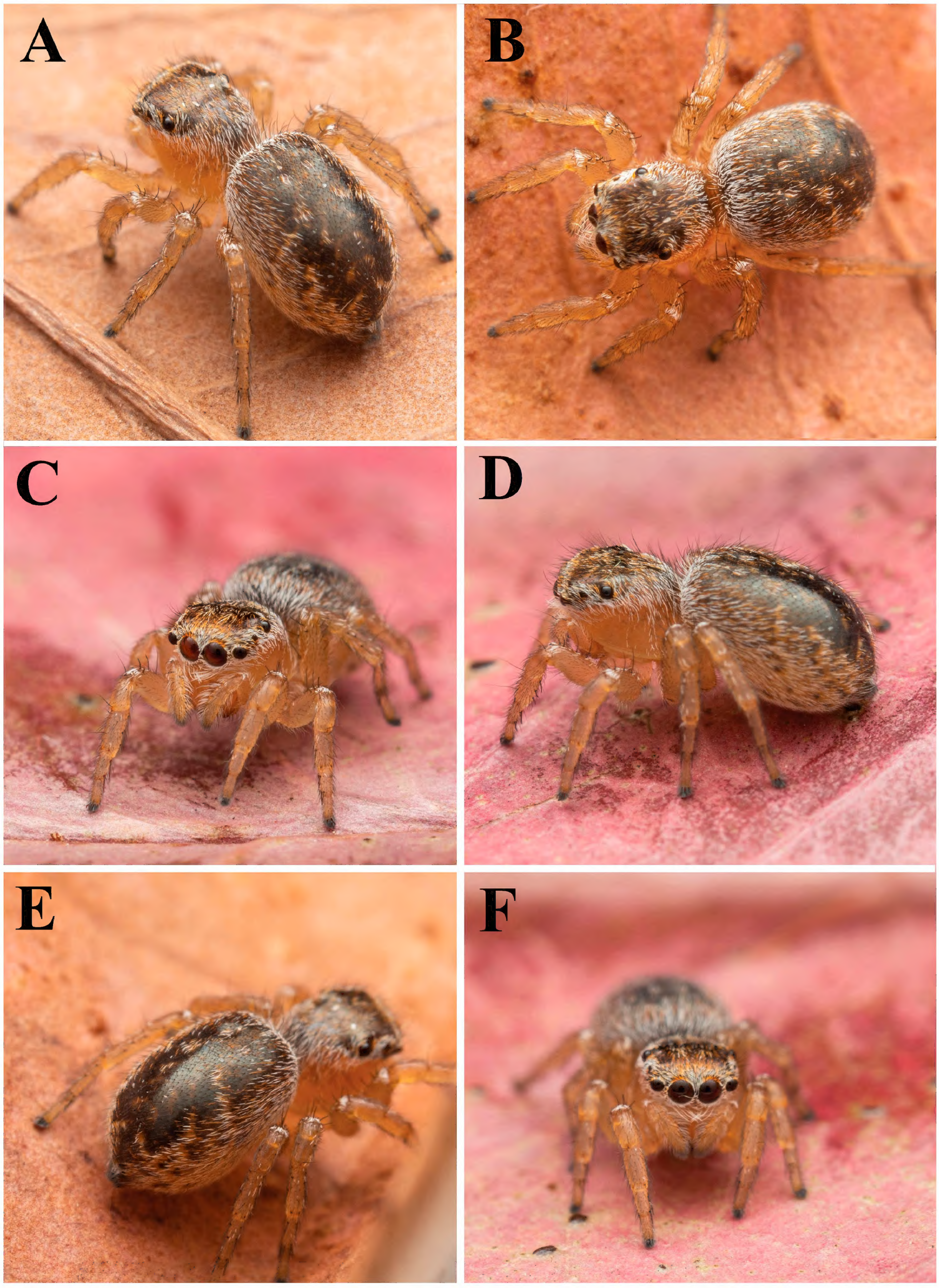

Figure 4. Habitus of living paratype female *Maratus nemo* sp. nov. (SAM NN30710) **A** dorsolateral view **B** dorsal view **C** anterolateral view **D** lateral view **E** posterolateral view **F** anterior view.

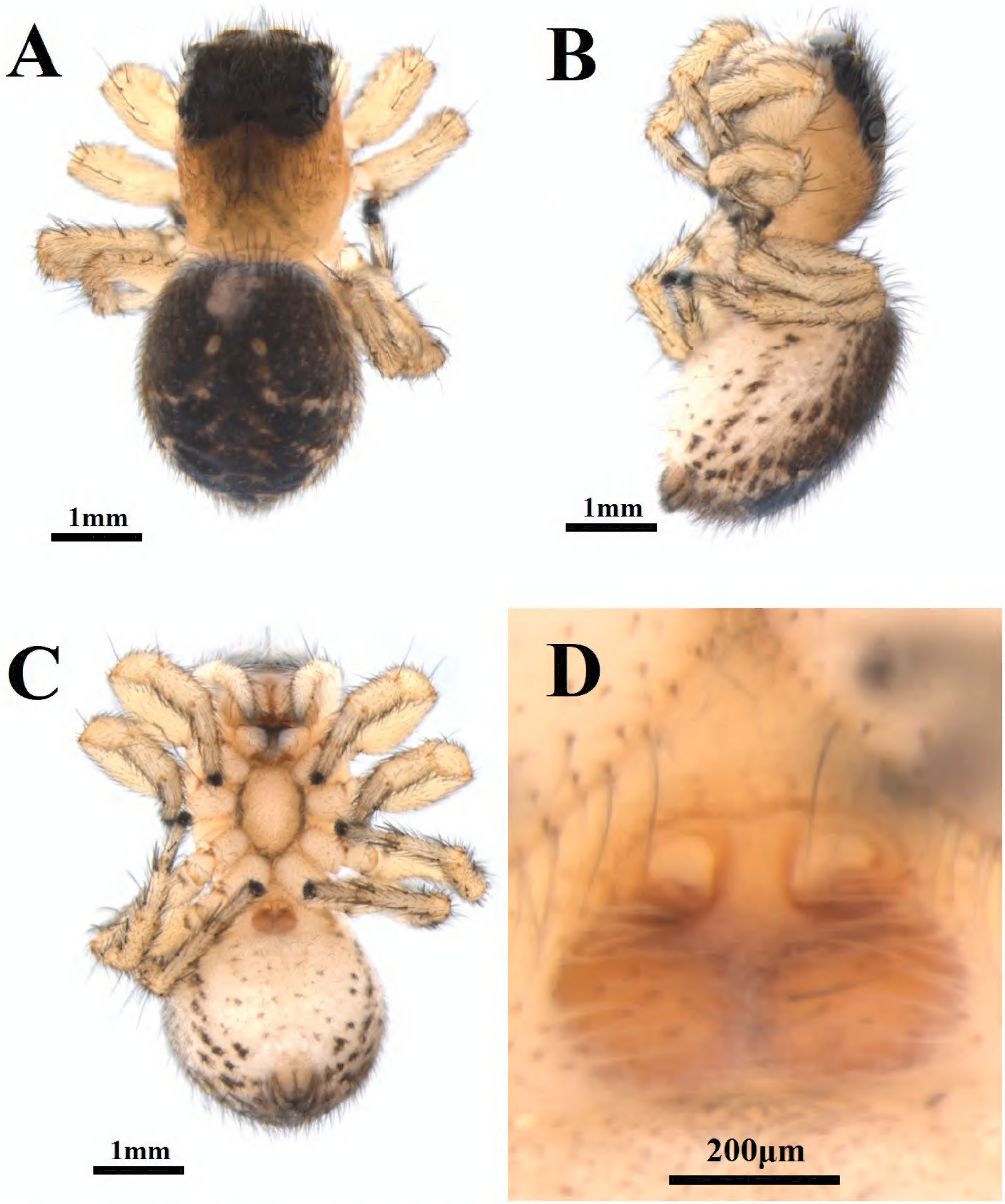

Figure 5. Preserved paratype female *Maratus nemo* sp. nov. (SAM NN30710) **A** dorsal view **B** lateral view **C** ventral view **D** ventral view of epigyne. Scale bars: 1mm for whole specimen, 0.2mm for epigyne).

Female (Paratype): Ocular quadrangle region dark brown with light cover of light brown and off-white setae (Fig. 4A–F); rear slope of carapace with thicker covering (Fig. 4A, B, D, E). Lateral slopes of carapace light brown and glabrous (Fig. 4A, D).

Anterior eyes ringed with white and red-brown scales. Long white setae project downwards from below AME forming triangular shape (Figs 4A–D, F, 5A). Clypeus lightly covered with short, white setae. Chelicerae dark brown and glabrous. Coxae pale, endites and labium dark brown, translucent and mostly glabrous. Sternum dark brown with light covering of fine, white setae (Fig. 5C).

Dorsal opisthosoma dark brown with incomplete cover of off-white and dark brown setae, otherwise mostly glabrous (Fig. 4A–F). Colular tuft of white setae situated above spinnerets (Fig. 4A, E). Lateral and ventral

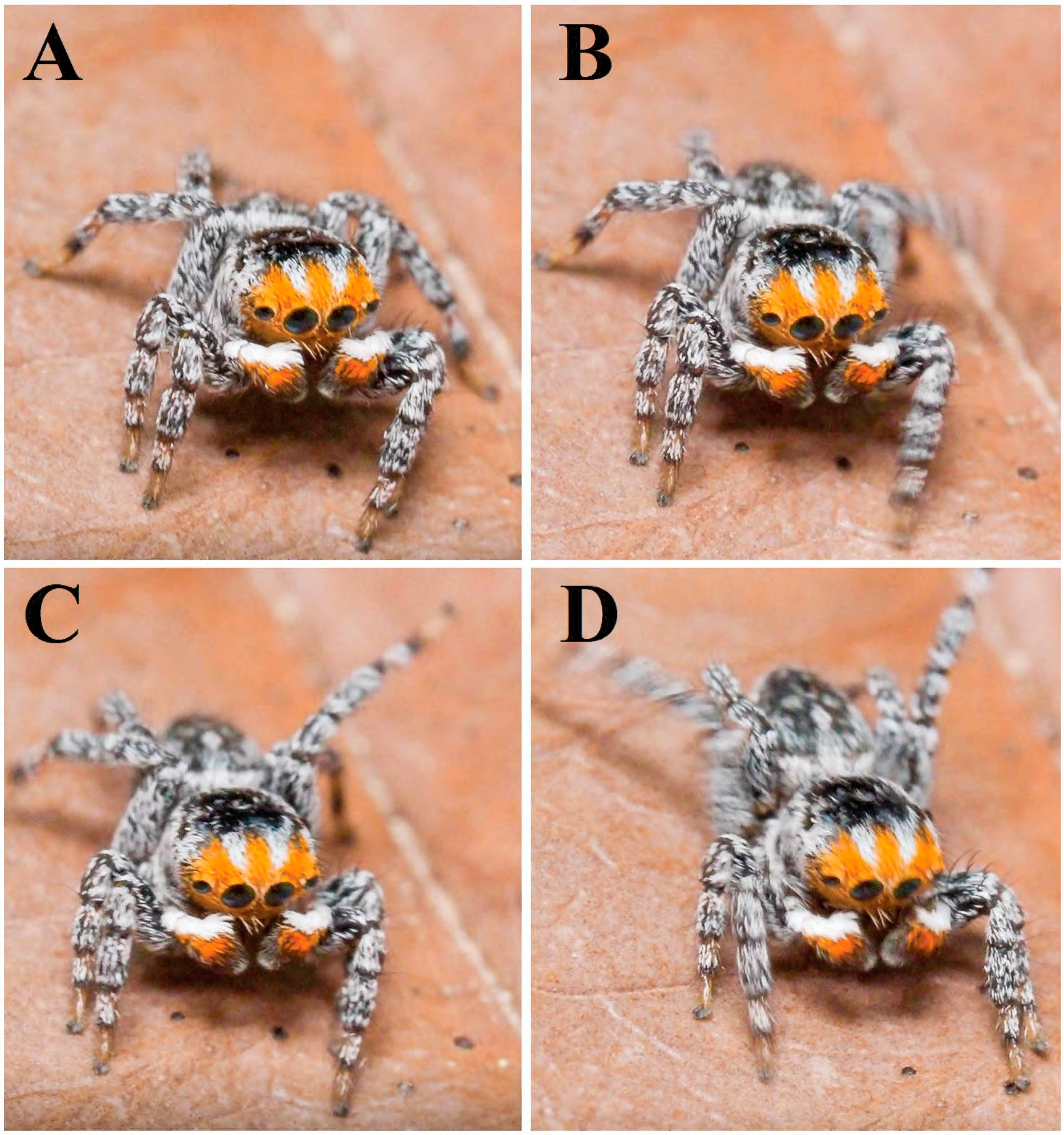

Figure 6. Sequential frames from a video of the courtship display of paratype male *Maratus nemo* sp. nov. (SAM NN30709) **A** stationary male focusing on a nearby female **B** left leg III extended and waved **C** left leg III extended and flexed and slow opisthosomal bobbing **D** both legs III extended and waved and opisthosoma is rapidly vibrated on the surface of the leaf creating an audible sound.

opisthosoma light brown and marked irregularly with dark spots (Fig. 5B, C).

Legs I and II subequal in length, legs III and IV longer, legs III longest. Each leg with incomplete cover of off-white and brown setae, integument below light brown and translucent (Fig. 4A–F). Pedipalps light brown and translucent with incomplete cover of white setae. Epigynum with pair of large ovate fossae separated by septum. Ovate posterior spermatheca behind each fossa. Sclerotized ducts present anterior to each spermatheca (Fig. 5D).

Variation. Between paratype males and the holotype male, the coverings of white scales on the dorsal opisthosoma and carapace and the colular tuft are more or less distinct, likely due to scales rubbing off. The width and colour of orange tracts of scales marking the ocular quadrangle also slightly vary (Fig. 7A–D).

Dimensions. Males. Total length: 4.10–4.25 (4.17 ± 0.06, n=4). Carapace length 2.02–2.35 (2.18 ± 0.12, n=4). Opisthosoma length 1.87–2.17 (1.99 ± 0.12, n=4).

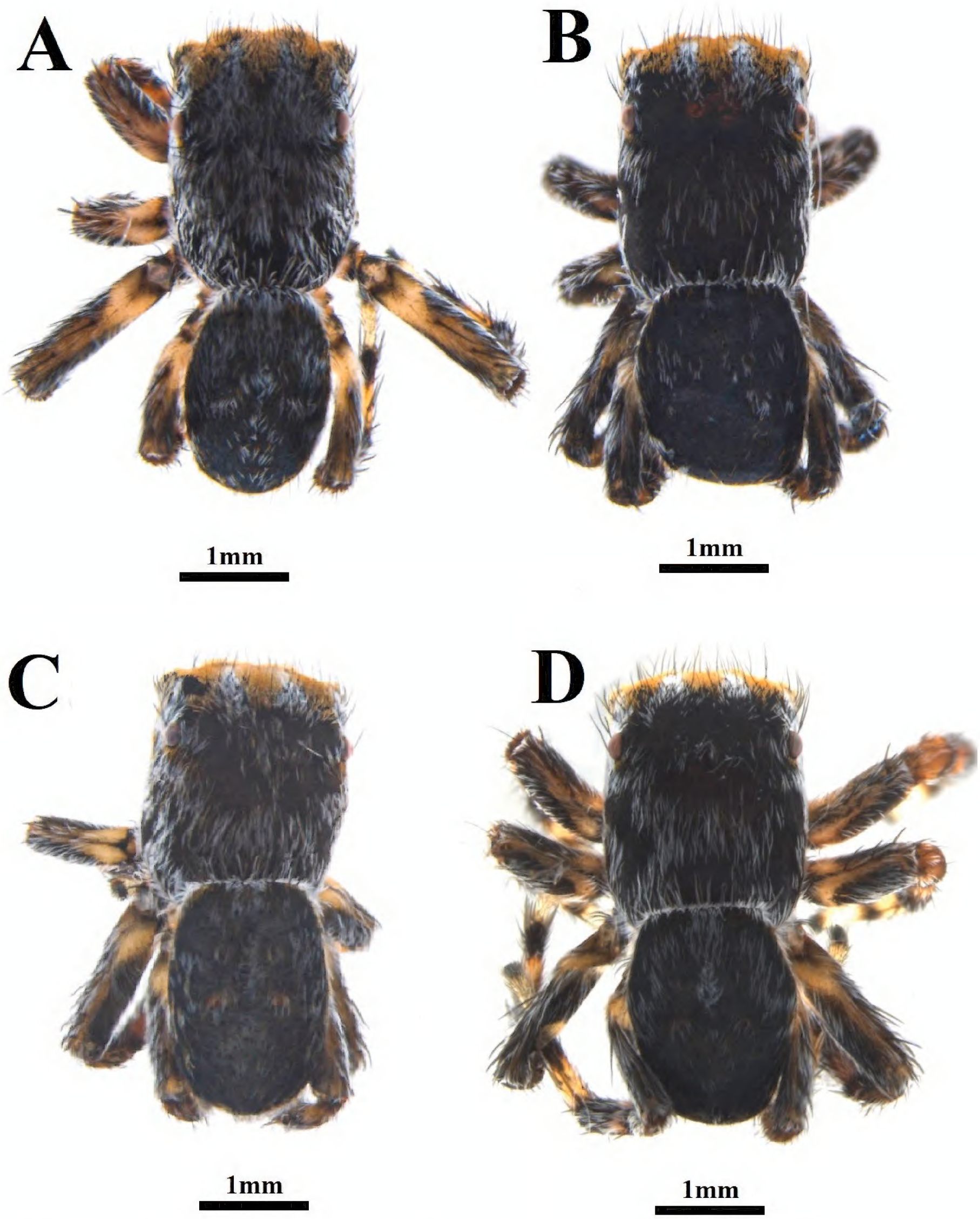

Figure 7. Variation in preserved holotype (SAM-NN30706) and paratype (paratypes: SAM NN30707–30709) male *Maratus nemo* sp. nov. specimens: **A** paratype male (SAM NN30709) **B** paratype male (SAM NN30707) **C** paratype male (SAM NN30708) **D** holotype male (SAM-NN30706). Scale bars: 1mm.

Female. Total length: 5.12. Carapace length: 2.39. Opisthosoma length: 2.73.

Courtship display. The male elevates a single leg III, slowly waving it in a partially flexed position (Fig. 6B, C). As the female approaches, the male raises and more rapidly waves both legs III (Fig. 6D). The opisthosoma is rapidly bobbed upwards and downwards but not completely elevated. The rapid opisthosomal bobbing created audible vibrations on the surface of the leaf shown in Fig. 6D. Only partial courtship display

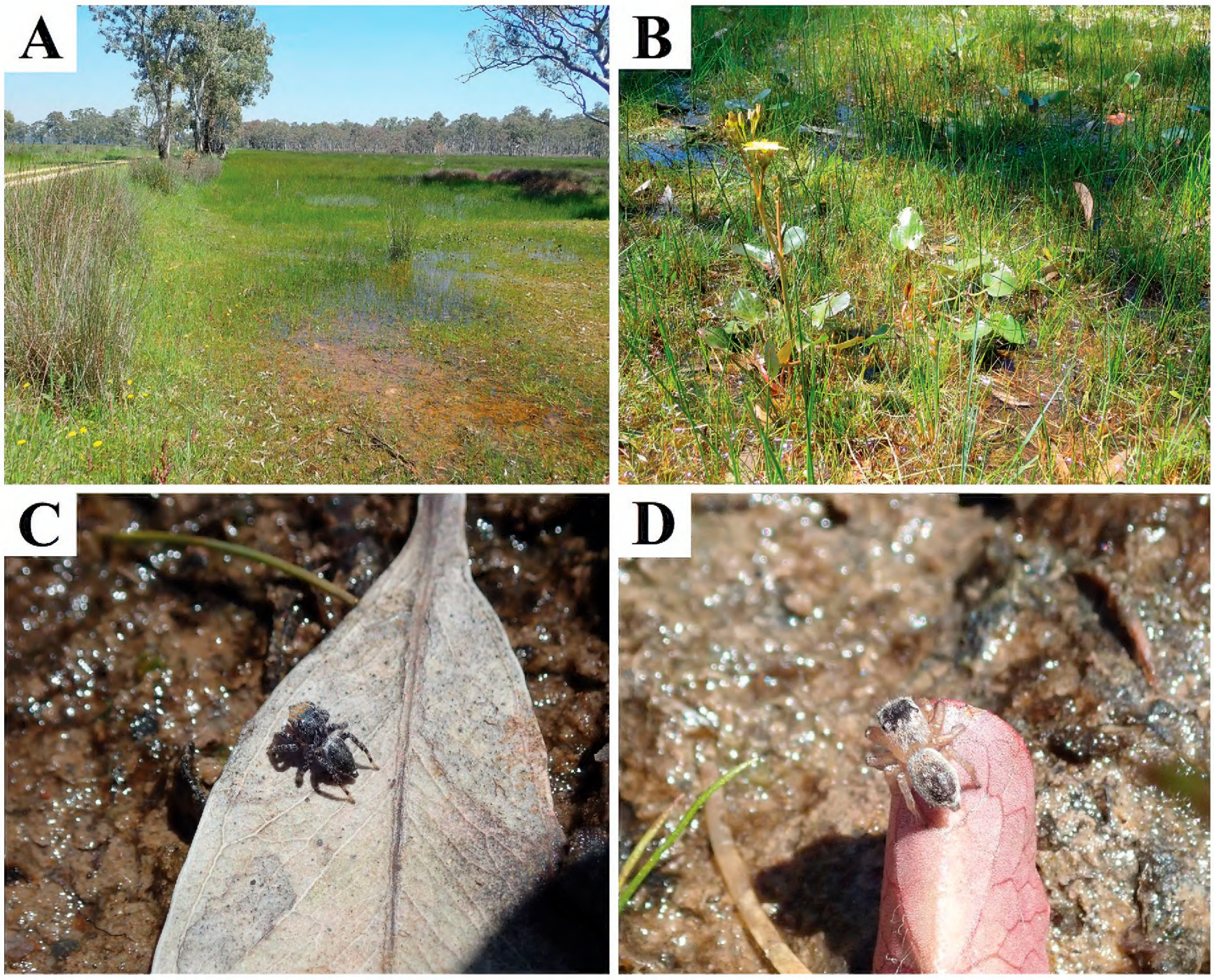

Figure 8. Habitat of *Maratus nemo* sp. nov. in the vicinity of Mount McIntyre, South Australia. (Photos provided by Sheryl Holliday, used with permission) **A** ephemeral wetland complex habitat at the type locality **B** marshy vegetation from the type locality **C** *Maratus nemo* sp. nov. male *in situ* **D** *Maratus nemo* sp. nov. female *in situ.*

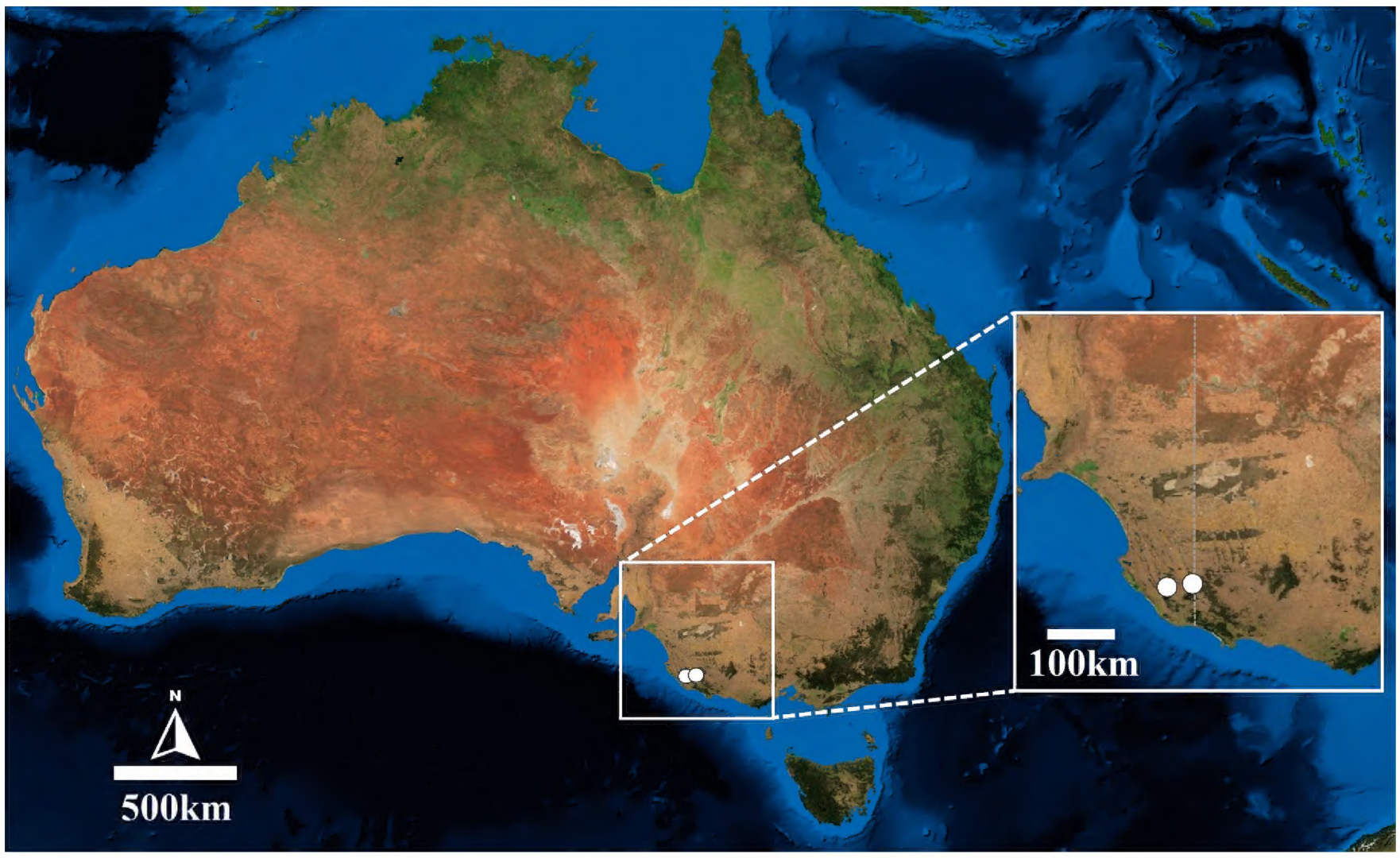

Figure 9. Localities *Maratus nemo* sp. nov. is known from in Southern Australia (9.5km SSE of Mount McIntyre, 9.4km SSE of Mount McIntyre, and 14.1km E of Nangwarry).

observed in an artificial environment, in the wild males may exhibit a more complete courtship display with multiple modes of courtship.

Distribution and habitat. Known only from 9.5 km SSE of Mount McIntyre, 9.4km SSE of Mount McIntyre, and 14.1km E of Nangwarry (Fig. 9). Curiously, *M. nemo* was found in an ephemeral wetland complex on marshy vegetation in shallow water (Fig. 8). No other species of *Maratus* are known to occupy such habitats.

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